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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/596,718

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Mitsunori Ishimasa

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Reston, VA 20191

EXAMINER

GORDON, BRYAN P

ART UNIT

PAPER NUMBER

2834

NOTIFICATION DATE

DELIVERY MODE

05/18/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/596,718	Applicant(s) ISHIMASA ET AL.	
	Examiner BRYAN P. GORDON	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>22 June 2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 5 is objected to because of the following informalities:

The applicant claims "an overamplitude-preventing receiver is located closer to a center of the piezoelectric diaphragm than to the supports".

The examiner does not see how this is possible since the applicant also claims "supports on an inner portion thereof to support four corners of a bottom surface of the piezoelectric diaphragm".

In the applicant's specification (paragraph 0051) sets forth "supports (10f) are provided inside the four corners of the case (10) to support the bottom surfaces of the diaphragm (10 at the corners". There are two overamplitude-preventing receivers are located in opposite corners. Therefore, the examiner does not see how the receivers are located closer to the center of the diaphragm than to the supports when two of four corners contain receivers and supports.

Looking at Figure 8 of the application you can clearly see the receiver (10p) and support (10f) which appear to very close to each other.

The examiner does not believe the receiver is closer to the center of the diaphragm based on Figure 8.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 5-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshima (PG Pub 20020195901) and in view of Ishitoko (PG Pub 20020134155).

4. Considering claim 5, Takeshima (Figure 1) teaches a piezoelectric electroacoustic transducer comprising: a piezoelectric diaphragm (1) that is supplied with a periodic signal across electrodes thereof to bend and vibrate in a thickness direction; a casing (10) including supports (10g) on an inner portion thereof to support four corners of a bottom surface of the piezoelectric diaphragm; terminals (12) fixed to the casing, each having an inner connection portion (11a, 12a) exposed near the supports; a first elastic adhesive (13) disposed between a periphery of the piezoelectric diaphragm and the inner connection portions of the terminals to secure the piezoelectric diaphragm to the casing; a conductive adhesive (14) disposed between the electrodes

Art Unit: 2834

(2a) of the piezoelectric diaphragm and the inner connection portions of the terminals across a top surface of the first elastic adhesive to electrically connect the electrodes of the piezoelectric diaphragm to the inner connection portions of the terminals; a second elastic adhesive (15) filling and sealing a gap between the periphery of the piezoelectric diaphragm and the inner portion of the casing the second elastic adhesive fills a gap between the bottom surface of the piezoelectric diaphragm and a top surface of the overamplitude-preventing receiver.

However, Takeshima does not teach an overamplitude-preventing receiver disposed on the casing to limit amplitude of vibration of the piezoelectric diaphragm to a predetermined range.

In the same field of endeavor, Ishitoko (Figure 3) teaches overamplitude-preventing receiver (3c) disposed on the casing for the benefit of reducing excessive vibration by the vibrator.

Therefore, it would have been obvious to one of ordinary skill in the art the time the invention was made to include an overamplitude-preventing receiver disposed on the casing with Takeshima device for the benefit described above.

5. Considering claim 6, Takeshima in view of Ishitoko discloses the claimed invention except for the distance between the bottom surface of the piezoelectric diaphragm and the top surface of the overamplitude-preventing receiver is about 0.01 mm to about 0.2 mm. Lacking any stated criticality, it would have been obvious to one having ordinary skill in the art at the time the invention made to change the distance between the bottom surface of the piezoelectric diaphragm and the top surface of the

Art Unit: 2834

overamplitude-preventing receiver, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum of workable ranges involves only routine skill in the art.

6. Considering claim 7, Takeshima teaches wherein the first elastic adhesive has a Young's modulus of about 500×10^6 Pa or less after being cured and the second elastic adhesive has a Young's modulus of about 30×10^6 Pa or less after being cured (paragraphs 0048 + 0049).

7. Considering claim 8, Takeshima teaches the piezoelectric electroacoustic transducer wherein the first elastic adhesive is a urethane adhesive and the second elastic adhesive is a silicone adhesive (paragraphs 0048 + 0049).

8. Considering claim 9, Takeshima (Figure 10) teaches the piezoelectric diaphragm includes two piezoelectric ceramic layers (31, 32), and the electrodes include an inner electrode (37) disposed between the two piezoelectric ceramic layers, an outer (33, 34) electrodes disposed on top and bottoms surfaces of the piezoelectric diaphragm.

9. Considering claim 10, Takeshima (Figure 1) teaches the outer electrodes (2a) are disposed substantially over the entire top and bottom surfaces of the piezoelectric diaphragm.

10. Considering claim 11, Takeshima teaches wherein the casing is made of a heat-resistant resin (paragraph 0042).

11. Considering claim 12, Takeshima teaches wherein the heat-resistant resin is selected from the group consisting of a liquid crystal polymer, syndiotactic polystyrene, polyphenylene sulfide and epoxy (paragraph 0042).

Art Unit: 2834

12. Considering claim 13, Takeshima teaches the supports of the casing support only the four corners of the bottom surface of the piezoelectric diaphragm (paragraph 0063).

13. Considering claim 14, Takeshima teaches the casing further includes adhesive-receiving steps (10f) disposed at a height below the supports of the casing to receive the first elastic adhesive.

14. Considering claim 15, Takeshima discloses the claimed invention except for the conductive adhesive having a Young's modulus of about 0.3×10^6 . It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the Young's modulus, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

15. Considering claim 16, Takeshima (Figure 10) teaches the casing includes grooves (10h) around a periphery of the inner portion of the casing to receive the second elastic adhesive.

16. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshima (PG Pub 20020195901), in view of Ishitoko (PG Pub 20020134155) and in view of Nakamura (PG Pub 20030107300).

17. Considering claim 17, Takeshima in view of Ishitoko does not teach a tapered protrusion on inner surfaces of each sidewall of the casing.

Art Unit: 2834

In the same field of endeavor, Nakamura (Figure 8) teaches a tapered protrusion (10i) on inner surfaces of each sidewall of the casing for the benefit of guiding the four sides of the diaphragm.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a tapered protrusion on the inner surface of each sidewall of the casing with the combination above for the benefit described above.

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRYAN P. GORDON whose telephone number is (571)272-5394. The examiner can normally be reached on Monday-Thursday 8:00-5:30, Friday 7:30-4:00.

19. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached on 571-272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2834

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quyen Leung/
Supervisory Patent Examiner, Art Unit 2834

/Bryan P Gordon/
Examiner, Art Unit 2834